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BOLL WEEVIL

Cotton plant showing *a*, punctured squares on ground; *b*, square showing egg puncture; *c*, larva in square; *d*, pupa in square; *e*, adult emerging from square; *f*, larva and pupa in boll; *g*, adult. (Punctured squares on ground about one-fourth actual size, adult about 6 times actual size. other stages actual size.

(See other side for life history and control)

Picture Sheet No. 15

Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, United States Department of Agriculture

BOLL WEEVIL

(*Anthonomus grandis* Boh.)

Life History and Injury

Boll weevils pass the winter as adults in weeds, grass, woods trash, or other protected places near cottonfields. They leave winter quarters and return to cottonfields in the spring when the weather is warm enough for cotton to grow, and they remain there until frost. Boll weevils prefer to feed on and to lay their eggs in squares, but they also attack bolls. Eggs are laid singly in deep punctures made within the squares or bolls, and after 3 to 5 days they hatch into white larvae, or grubs. The grubs feed for 7 to 14 days within the squares or bolls in which they hatch and then change into pupae. The adults emerge from the pupae in 3 to 5 days and cut their way out of the bolls. After feeding on blooms, squares, or bolls for 3 to 4 days, the females are ready to lay eggs. The complete life cycle from egg to adult weevil requires about 3 weeks, and there may be seven or eight generations a year.

The leaflike bracts at the base of squares punctured by boll weevils open up, or flare, and the squares turn yellow and die. Most of the punctured squares and small bolls are shed, but some remain hanging to the plants. Large punctured bolls are not shed, but the lock in which a grub feeds fails to develop properly, and the lint is cut, stained brown, and decayed. When several weevil grubs develop within a boll, as often occurs, the entire boll is ruined.

Low winter temperatures and hot, dry summers help control the boll weevil. Watch for a rapid increase of weevils and severe damage during rainy periods.

Cultural Control

Farming practices that help set bolls quickly will aid in weevil control. These practices are as follows:

1. Plant cotton on good land that has been well prepared.
2. Use fertilizer recommended for your locality.
3. Select an early maturing variety suited for growing in your locality.
4. Plant early, space closely, and cultivate frequently.
5. Pick early and cleanly. After the cotton has been picked, stop further fruiting by plowing out, cutting, or grazing the cotton stalks as early as possible in the fall, to reduce the number of weevils in next year's crop.

Control With Dusts

Benzene hexachloride, calcium arsenate, chlordane, or toxaphene dusts applied while the cotton is fruiting will also control the boll weevil.

Some of these insecticides used alone may cause injurious infestations of aphids and some other cotton pests. Nicotine or benzene hexachloride may be added to control aphids, and sulfur may be included when red spider mites are present. The following dust mixtures have been found satisfactory: 20 percent of toxaphene plus 40 percent of sulfur; 5 percent of DDT plus sufficient benzene hexachloride to give a dust containing 3 percent of the gamma isomer and at least 40 percent of sulfur; and calcium arsenate containing 1 to 2 percent of nicotine.

To determine when dusting is needed, examine squares once a week or oftener for weevil punctures. Walk diagonally across the field and pick 100 squares that are half grown or larger. Pull only one square from a plant, taking about the same number from top, middle, and low branches. Count those squares having weevil punctures to determine the percentage of infestation. On light soils, where cotton does not grow rank and matures early, begin dusting when 10 to 15 percent of the squares are punctured. On fertile soils, where cotton continues to grow and fruit late in the season, wait until 20 to 25 percent of the squares are punctured.

Dust every 4 or 5 days until weevils are brought under control or until a crop of bolls is set. Apply organic insecticides at the rate of 10 to 12 pounds of the dust per acre, calcium arsenate at the rate of 7 to 10 pounds per acre. Repeat if the dust is washed off by rain within 24 hours.

Dusting may be done early in the morning, late in the afternoon, or at night, when the air is quiet. It is more important to dust when the air is calm than when the plants are wet with dew. Avoid dusting at midday, as the dust tends to rise if applied when temperatures are high.

Caution.—Insecticides are poisonous and should be handled with care. Store in a dry place where children and animals will not have access to them.

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